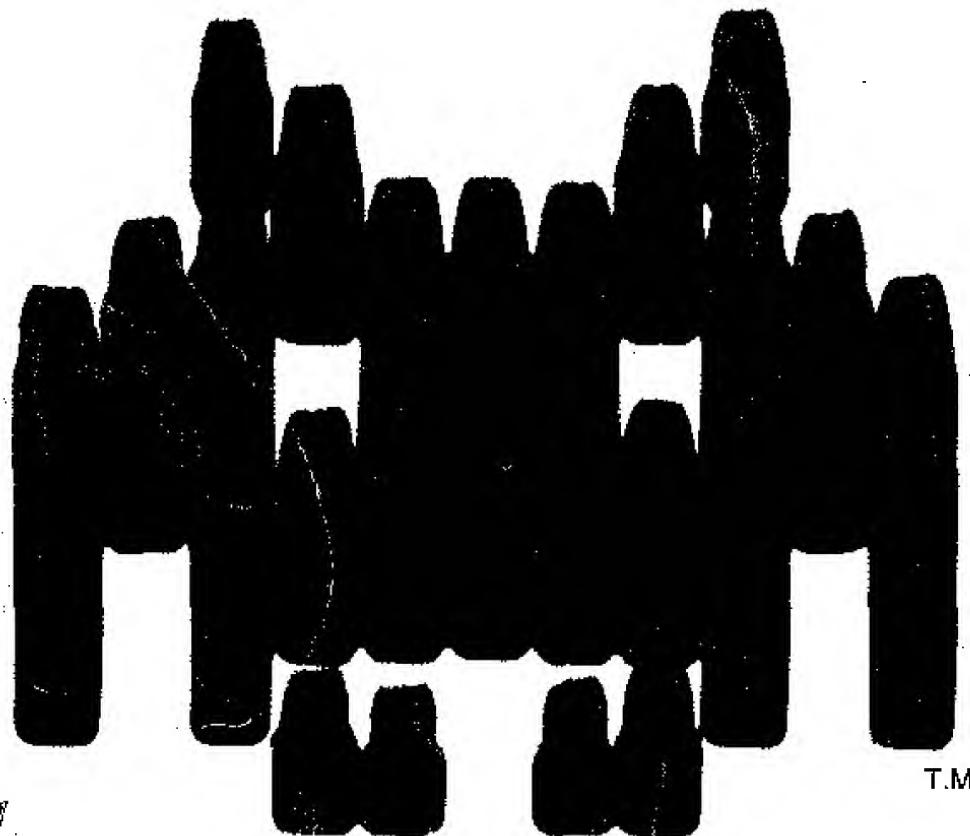


TRIMLINE™



Trade Marks of Taito America Corporation

# **SPACE INVADERS - BLACK & WHITE**

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## VOLUME CONTROL SETTINGS

- \* VR 1 - Adjusts the volume of the UFO.
- \* VR 2 - Adjusts the volume of the laser base when firing.
- \* VR 3 - Adjusts the volume of laser base when being destroyed.
- \* VR 4 - Adjusts volume of Invaders when being destroyed.
- \* VR 5 - Adjusts the volume of BEEP when a bonus is being awarded.
- \* VR 6 - Adjusts the volume of Invaders when advancing.
- \* VR 7 - Adjusts the volume of UFO when being destroyed.
- \* VR 8 - Adjusts the overall volume of SPACE INVADERS™ game.

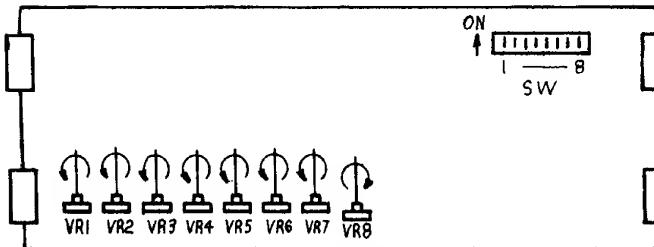


FIGURE 1 OPTION SETTING AND VOLUME CONTROL LOCATIONS

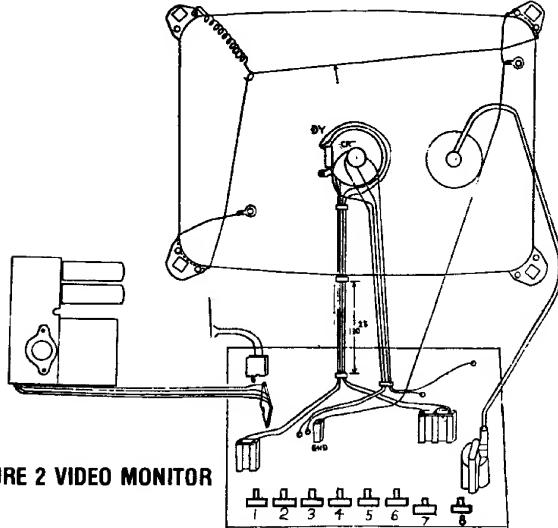


FIGURE 2 VIDEO MONITOR

## 2. MAINTENANCE

All games require a certain amount of maintenance to keep them in good condition. A periodic check of the mechanical controls would be beneficial to guarantee your game will be profitable.

### A. Cleaning

The exterior of the game, all metal parts and all plastic parts can be cleaned with an non-abrasive cleanser. Caution should be used when cleaning the plastic, a dry cloth can cause scratches and result in a foggy appearance.

### B. Fuse Replacement

This game uses six fuses, 5 are located on the Switching Regulator. One fuse is located on the Power Supply itself and would depend on whether the game was operating at 220VAC, 50HZ or 120VAC, 60HZ. See Figure 4, Page 7.

### C. Monitor Removal

If you should need to remove the monitor follow the directions listed below. See Figure 2, Page 3.

## CAUTION

It is recommended the game be left disconnected for at least one hour before removing the monitor. This will discharge the video monitor tube.

- Remove the control panel by releasing two spring loaded latches. These latches can be accessed through the coin door.
- Disconnect the wiring by separating connector K and all wires to the CRT.
- Remove the (3) screws from the "Z" bracket which leaves the cover glass free to be removed.
- Remove the (4) screws at each corner of the monitor and lift the monitor up and out of the cabinet.

## CAUTION

Use extreme caution and do not touch electrical parts of the monitor yoke area with your hands or with any metal object in your hands! High voltages may exist in any monitor, even with power disconnected.

### D. Video Monitor Adjustments

Refer to Figure 2 on Page 3 while reading the following description.

The video monitor is properly adjusted before shipping, however, if necessary, readjust the following controls on the monitor board.

- 1 **Vertical Linearity Control** is adjusted to obtain a symmetrical picture or pattern from top to bottom of the screen.
- 2 **Vertical Size Control** is used to obtain the correct vertical size of the displayed picture on the CRT screen.
- 3 **Vertical Hold Control** when adjusted correctly will lock the picture vertically, misadjustment will cause rolling of displayed picture.
- 4 **Brightness Control** is used to adjust the brightness level without going out of focus.
- 5 **Contrast Control** is used to adjust the brightness level without the picture going out of focus.
- 6 **Horizontal Place Control** is a visual adjustment used to center the picture in the viewing area of the picture tube.
- 7 **Horizontal Hold Control** when misadjusted will show diagonal lines across the CRT screen. Use this control to lock the horizontal sync back into place.
- 8 **Focus Control** adjustment is made at a normal brightness level and should be adjusted to obtain well defined scan lines.

### NOTE:

The Monitor is mounted into the Space Invaders™ Trimline™ cabinet vertically. When adjusting the screen the vertical adjustments will seem to be horizontal adjustments.

### E. Fluorescent Tube Replacement

## CAUTION

If you drop a fluorescent tube and it breaks it will explode! Please use care when replacing.

To replace the fluorescent bulb the control panel must be removed. With both hands turn the bulb toward you and carefully pull out of the lamp sockets.

### F. Printed Circuit Board Replacement

You may wish to remove the Space Invaders™ printed circuit boards for replacement or service. To do so refer to Figure 3 on Page 5 and the following:

To remove the "A" board, "B" board, or the Game board, loosen the wing screw located on top of the PCB chassis. Then slide the stop bracket to the side and slide the PCB board to be removed out of the guides.

**"Warning:** This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. As temporarily permitted by regulation it has not been tested for compliance pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference."

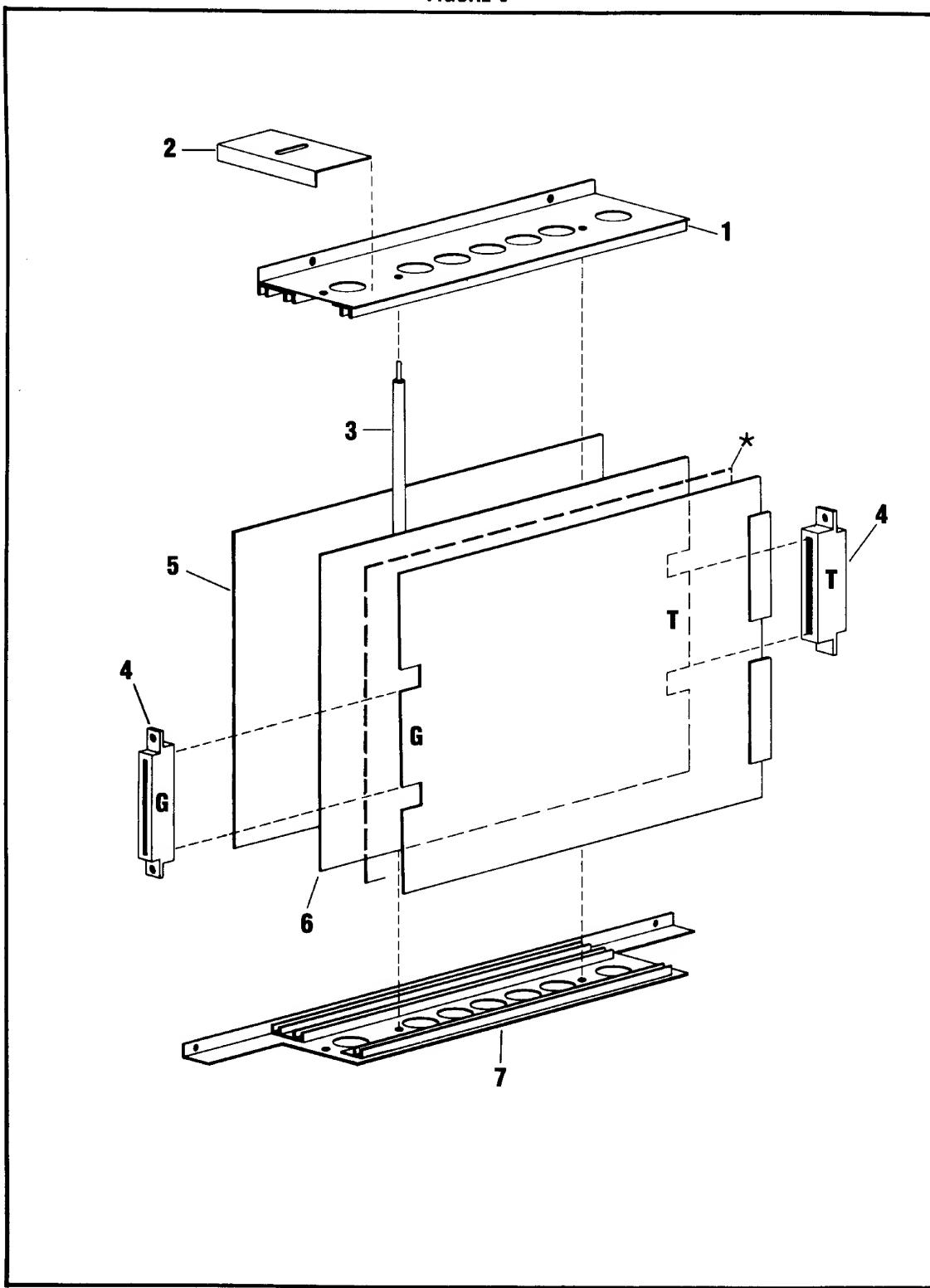
## MOUNTING CHASSIS ASSEMBLY

ITEM	TAITO PART NO.	DESCRIPTION	REFERENCE
1	850007	P.C. Board Guide "B"	WTO 90008
2	500057	Stop Bracket	CVO 30023
3	500059	Shaft P.C. Chassis	TVO 20001
4	100034	50 Position Housing Connector	

ITEM	TAITO PART NO.	DESCRIPTION	REFERENCE
5	500055	Plate Shield	CVO 30023
6	850081	Overall Board Set	
7	850006	P.C. Board Guide "A"	AAO 19547

\* Item 6 may be 2 or 3 board set

FIGURE 3



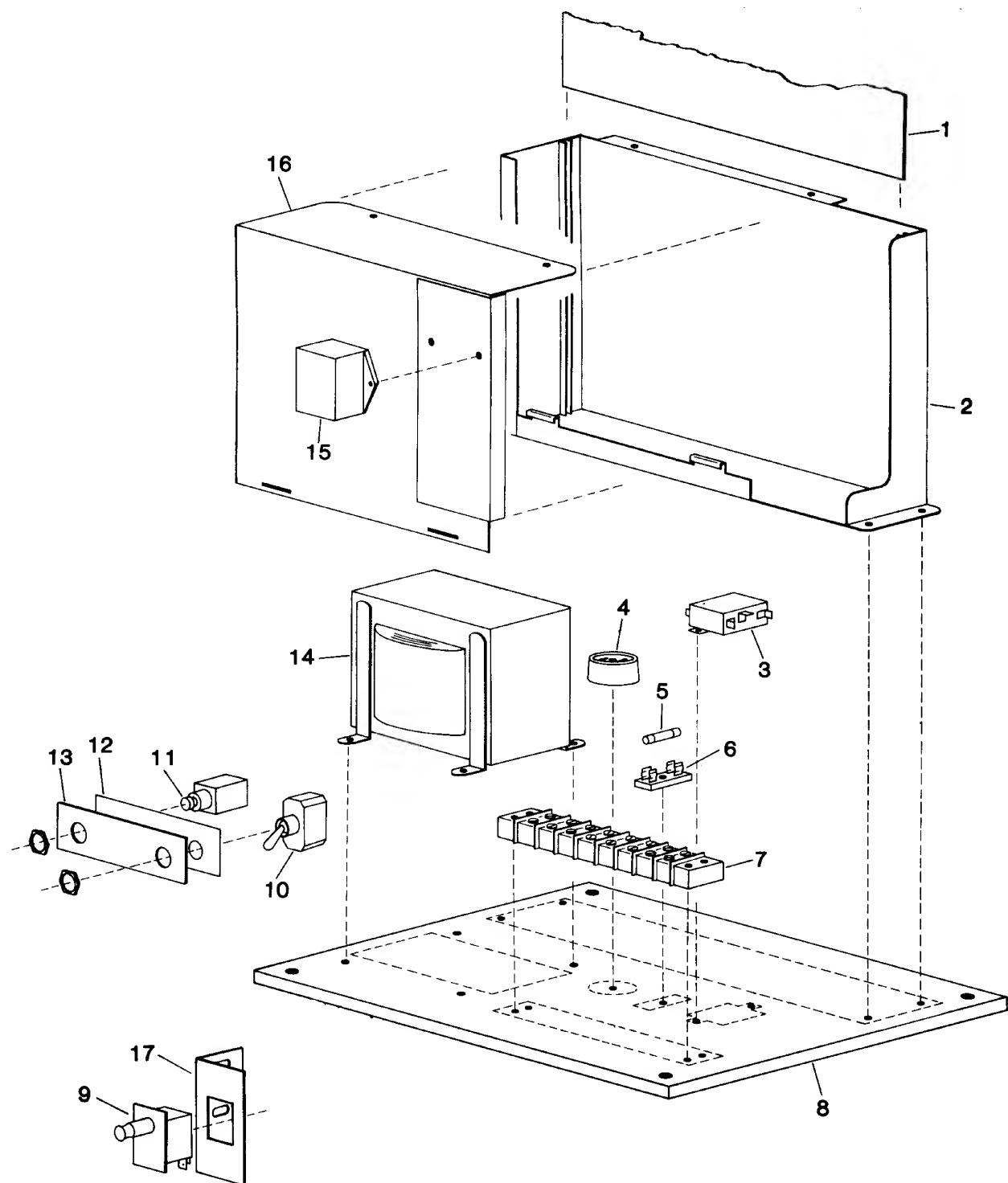
**SWITCHING REGULATOR (POWER SUPPLY)  
& CABINET PARTS**

FIGURE 4

ITEM	TAITO PART NO.	DESCRIPTION	REFERENCE
1	800010	Switching Regulator PCB Assy.	AAM 60009
2	998702	Shield Box	AAO 13613
3	195004	Power Line Filter	
4	021000	Service Outlet	
5	170005	Fuse, 3 AMP, 3AG, Slo-Blo, 250V	
5A	170006	Fuse, 1.5AMP,3AG, Slo-Blo, 250V	
6	171000	Fuse Holder	
7	100027	Barrier Strip, 8 position	
8	850071	Power Board	
9	024001	Switch Interlock	
10	021500	Toggle Power Switch	
11	024501	Momentary Switch,Hi-Score Erase	Some Models
12	199015	Insulating Shield	Some Models
13	500025	Toggle Switch Bracket	
14	010002	Isolation Transformer	
15	019501	Noise Filter	AAT 61017
16	998703	Shield Cover	AAO 13614
17	500064	Bracket - Interlock Switch	

## SWITCHING REGULATOR (POWER SUPPLY) & CABINET PARTS

FIGURE 4



# GAME BOARD

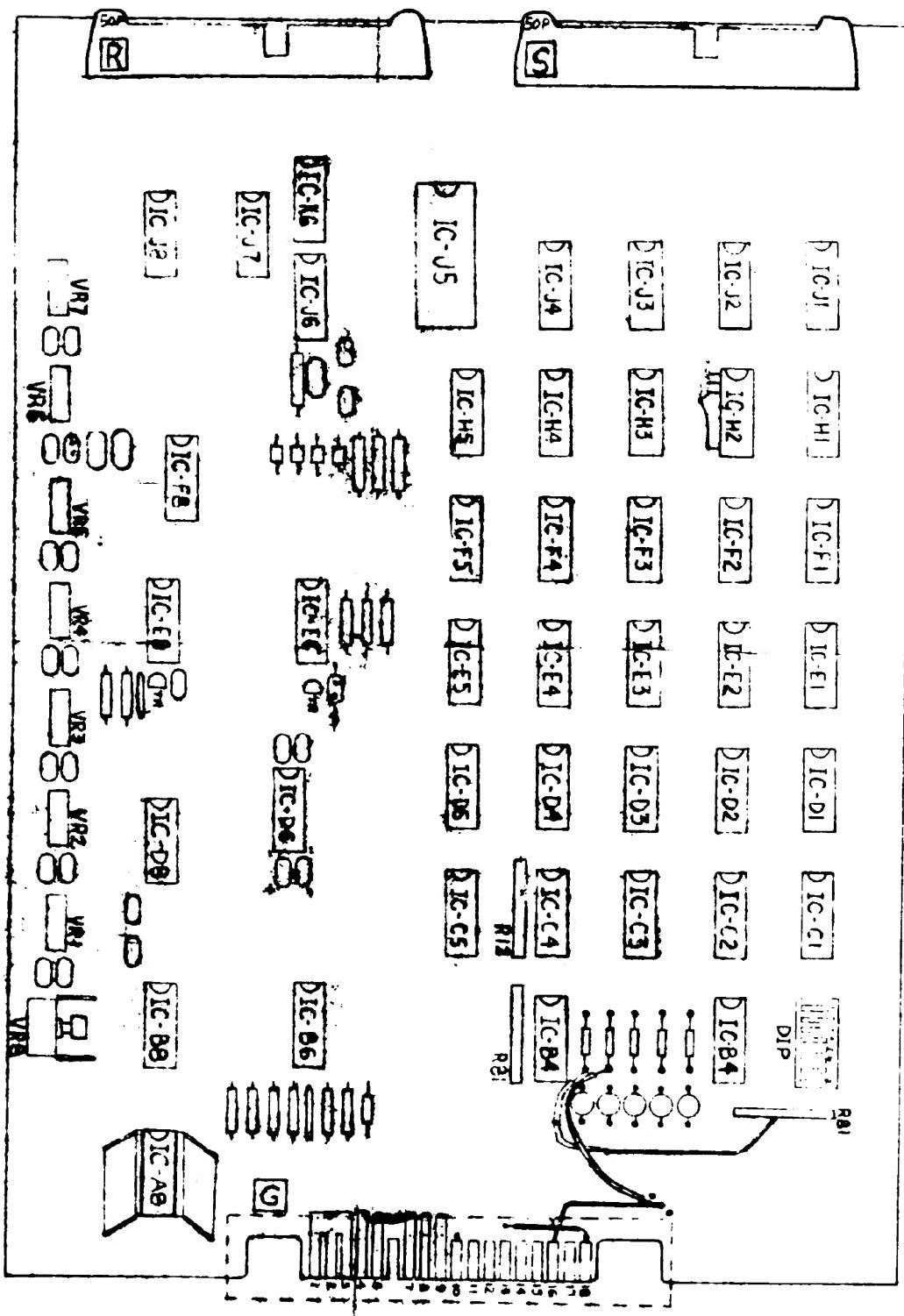
FIGURE 5

ITEM	SYMBOL	TAITO PART NO.	DESCRIPTION	REFERENCE
1		802006	Printed Circuit Board	CVO 70005
2		100000	Angle Pin Header P050 50 Pin	AAO 55154
3		160015	Variable Res 50K	AAT 53041
4		150015	Variable Res 50K(VR8)	AAT 53047
5		006067	Res, Block, 1K (8 element)	AAT 55036
6		006072	Res, Block, 1.5K (8 element)	AAT 55038
7	DIP (B-1)	020006	Dip Switch D SS-8	
8		030265	Cap, Lytic 100uf, 16V	AAT 41022
9		030758	Cap, Lytic 10uf, 25V	AAT 41107
10		025022	Cap, Ceramic 330pf, 50V	AAT 41330
11		025024	Cap, Ceramic 470pf, 50V	AAT 41334
12		036000	Cap, Tantalum, 1uf, 35V	AAT 41431
13		036004	Cap, Tantalum, .22uf, 35V	AAT 41432
14		036008	Cap, Tantalum, .47uf, 35V	AAT 41434
15		036012	Cap, Tantalum, 1uf, 35V	AAT 41436
16		036016	Cap, Tantalum, 2.2uf, 35V	AAT 41437
17		036020	Cap, Tantalum, 4.7uf, 35V	AAT 41439
18		036024	Cap, Tantalum, 10uf, 35V	AAT 41606
19		040535	Cap, Mylar, .001uf, 100V	AAT 41232
20		040500	Cap, Mylar, .01uf, 100V	AAT 41238
21		040512	Cap, Mylar, .1uf, 100V	AAT 41244
22		054000	Diode Zener	AAT 13028
23		052001	Diode	AAT 12025
24		050001	Transistor 2SC 372-0 (9014)	AAT 11020
25	BC-6, BC-8	079000	IC, Amplifier LM 3900 (9014)	AAT 31011
26	D-6, D-8, EF-6, EF-8 FH-80, A-8	079008	IC, Amplifier LM 377	AAT 31032
27	J-6	080015	IC Timer NE556	AAT 31028
28	F-5	075000	IC TTL 7400	AAT 32001
29	H-2, E-5	075004	IC TTL 7404	AAT 32003
30	D-5	075024	IC TTL 7432	AAT 32021
31	C-5	075014	IC TTL 7416	AAT 32033
32	H-4, F-4	075015	IC TTL 7417	AAT 32049
33	K-6	075173	IC TTL 7411	AAT 32121
34	JK-5	083004	IC TTL 76477	AAT 32141
35	H-5	075045	IC TTL 7474	AAT 32011
36	H-1, F-1	075100	IC TTL 74161	AAT 32018
37	B-2, B-4	076010	IC LS 74LS14	AAT 33015
38	F-2	076024	IC LS 74LS42	AAT 33032
39	J-1, J-2,	076144	IC LS 74LS151	AAT 33106
40	J-3, J-4, D-1, D-2, D-3, D-4 C-1, C-2,	076157	IC LS 74LS153	AAT 33108

ITEM	SYMBOL	TAITO PART NO.	DESCRIPTION	REFERENCE
41	C-3, C-4 H-3, F-3,	076172	IC LS 74LS174	AAT 33127
42	E-3, E-4 E-1, E-2	076173	IC LS 74LS175	AAT 33128
43	K-7	076500	C-Mos CD 4006A	AAT 36007
44	K-8	076503	C-Mos CD 4030A	AAT 36031
45		000039	Res, 68ohm 1/4W	
46		000043	Res, 100ohm 1/4W	
47		000053	Res, 270ohm 1/4W	
48		000061	Res, 560ohm 1/4W	
49		000067	Res, 1K ohm 1/4W	
50		000074	Res, 2K ohm 1/4W	
51		000081	Res, 3.9K ohm 1/4W	
52		000083	Res, 4.7K ohm 1/4W	
53		000087	Res, 6.8K ohm 1/4W	
54		000091	Res, 10K ohm 1/4W	
55		000099	Res, 22K ohm 1/4W	
56		000101	Res, 27K ohm 1/4W	
57		000103	Res, 33K ohm 1/4W	
58		000107	Res, 47K ohm 1/4W	
59		000109	Res, 56K ohm 1/4W	
60		000112	Res, 75K ohm 1/4W	
61		000115	Res, 100K ohm 1/4W	
62		000117	Res, 120K ohm 1/4W	
63		000119	Res, 150K ohm 1/4W	
64		000122	Res, 200K ohm 1/4W	
65		000123	Res, 220K ohm 1/4W	
66		000125	Res, 270K ohm 1/4W	
67		000127	Res, 330K ohm 1/4W	
68		000131	Res, 470K ohm 1/4W	
69		000133	Res, 560K ohm 1/4W	
70		000135	Res, 680K ohm 1/4W	
71		000139	Res, 1M ohm 1/4W	
72		000143	Res, 1.5M ohm 1/4W	
73		000147	Res, 2.2M ohm 1/4W	
74		000149	Res, 2.7M ohm 1/4W	
75		000151	Res, 3.3M ohm 1/4W	
76		000155	Res, 4.7M ohm 1/4W	
77		000267	Res, ± 2% 1K ohm 1/4W	
78		000298	Res, ± 2% 20K ohm 1/4W	
79		000311	Res, ± 2% 68K ohm 1/4W	
80		000313	Res, ± 2% 82K ohm 1/4W	
81		000339	Res, ± 2% 100K ohm 1/4W	

## GAME BOARD

**FIGURE 5**



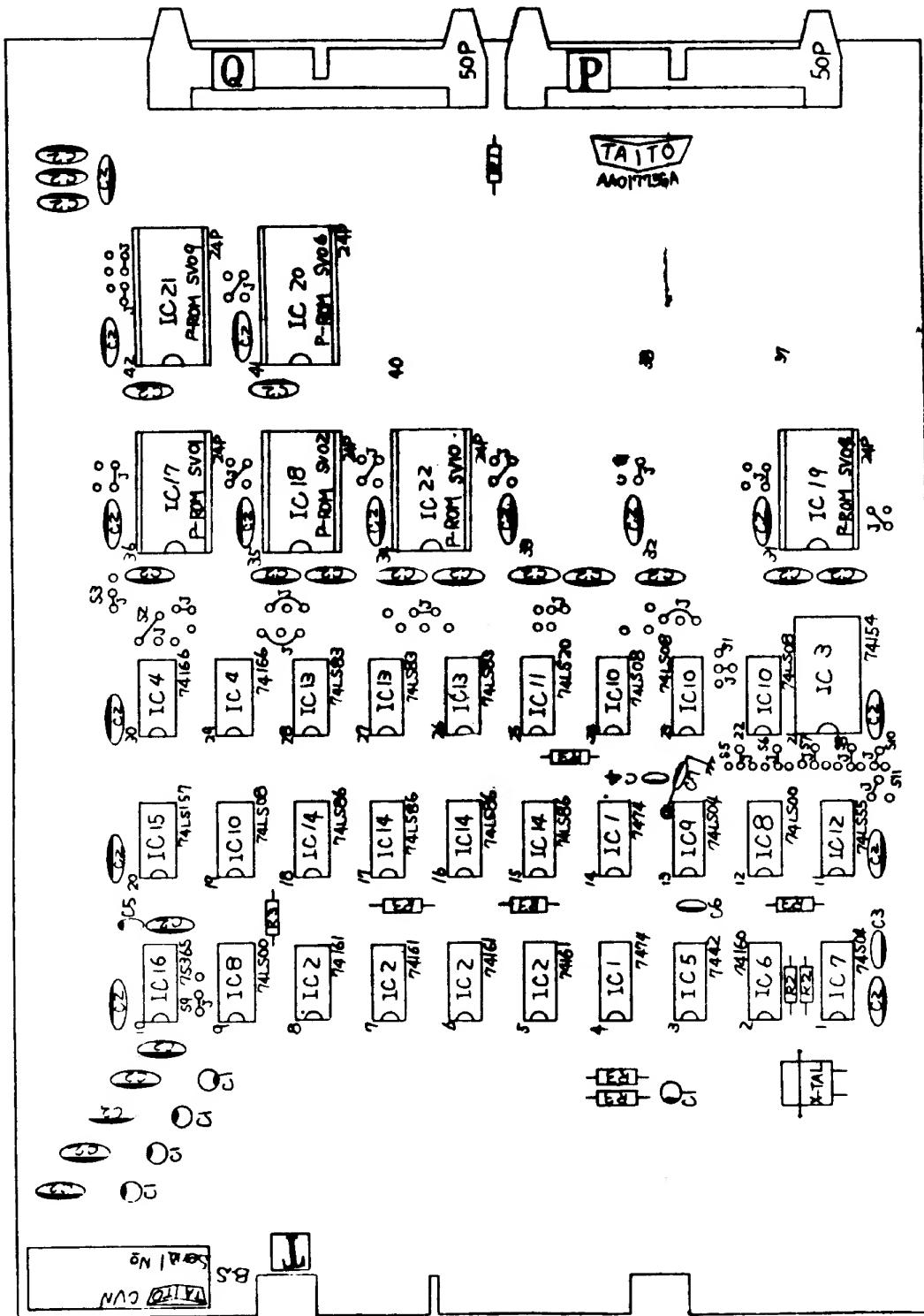
**C.P.U. - P.C. BOARD (A) C.V.**

**FIGURE 6**

ITEM	SYMBOL	TAITO PART NO.	DESCRIPTION	REFERENCE
1				AAO 17756A
2	P	122015	Connector Sticker,P	AAO 17653
3	O	122016	Connector Sticker,O	AAO 17656
4	T	122019	Connector Sticker,T	AAO 17665
5	50P	100000	Angle Pin Header,PS-50PA	AAO 55154
6	24P	090009	IC Socket,24P	AAO 55787
7	X-TAL	049004	X-TAL,19.968 MH2±10%	AAO 69539
8	IC1	075045	TTL IC,7474	AAT 32011
9	IC2	075100	TTL IC,74161	AAT 32018
10	IC3	075094	TTL IC,74154	AAT 32027
11	IC4	075105	TTL IC,74166	AAT 32028
12	IC5	075029	TTL IC,7442	AAT 32039
13	IC6	075099	TTL IC,74160	AAT 32086
14	IC7	075703	TTL IC,74S04	AAT 32096
15	IC8	076000	LS IC,74LS00	AAT 33001
16	IC9	076003	LS IC,74LS04	AAT 33005
17	IC10	076005	LS IC,74LS08	AAT 33009
18	IC11	076012	LS IC,74LS20	AAT 33019
19	IC12	076030	LS IC,74LS55	AAT 33043
20	IC13	076035	LS IC,74L583A	AAT 33059
21	IC14	076037	LS IC,74IS86	AAT 33062
22	IC15	076060	LS IC,74LS157	
23	IC16	075172	Clock Driner,SN75365	AAT 35002
24	IC17		E-PROM,SV01	SVO 90001
25	IC18		E-PROM,SV02	SVO 90002
26	IC19		E-PROM,SV04	SVO 90004
27	IC20		E-PROM,SV06	SVO 90006
28	IC21		E-PROM,SV09	SVO 90014
29	IC22		E-PROM,SV09	SVO 90015
30	C1	030758	Cap,Electrolytic 25YB-10	AAT 41032
31	C2	040512	Cap,Film,TDY-1H-104	AAT 41244
32	C3	025028	Cap,Ceramic DT 203-180PF-50V	AAT 41324
33	C4	025022	Cap,Ceramic DT 205-330PF-50V	AAT 41330
34	C5	035512	Cap,Tantalum,SSG 25-1F-50V	AAT 41425
35	R1	000035	Res,Carbon 470HM 1/4W±5%	AAT 51733
36	R2	000055	Res,Carbon 330	AAT 51753
37	R3	000067	Res,Carbon 1K ohm 1/4W±5%	AAT 51765
38	C6	040535	Cap,Film TDY-1H-102	AAT 41232
39	J		Tinned Copper Wire 1 0 200mm	
40	C7		Cap,Ceramic 330PF(Remove Parts)	AAT 41330

# C.P.U. - P.C. BOARD (A) C.V.

FIGURE 6



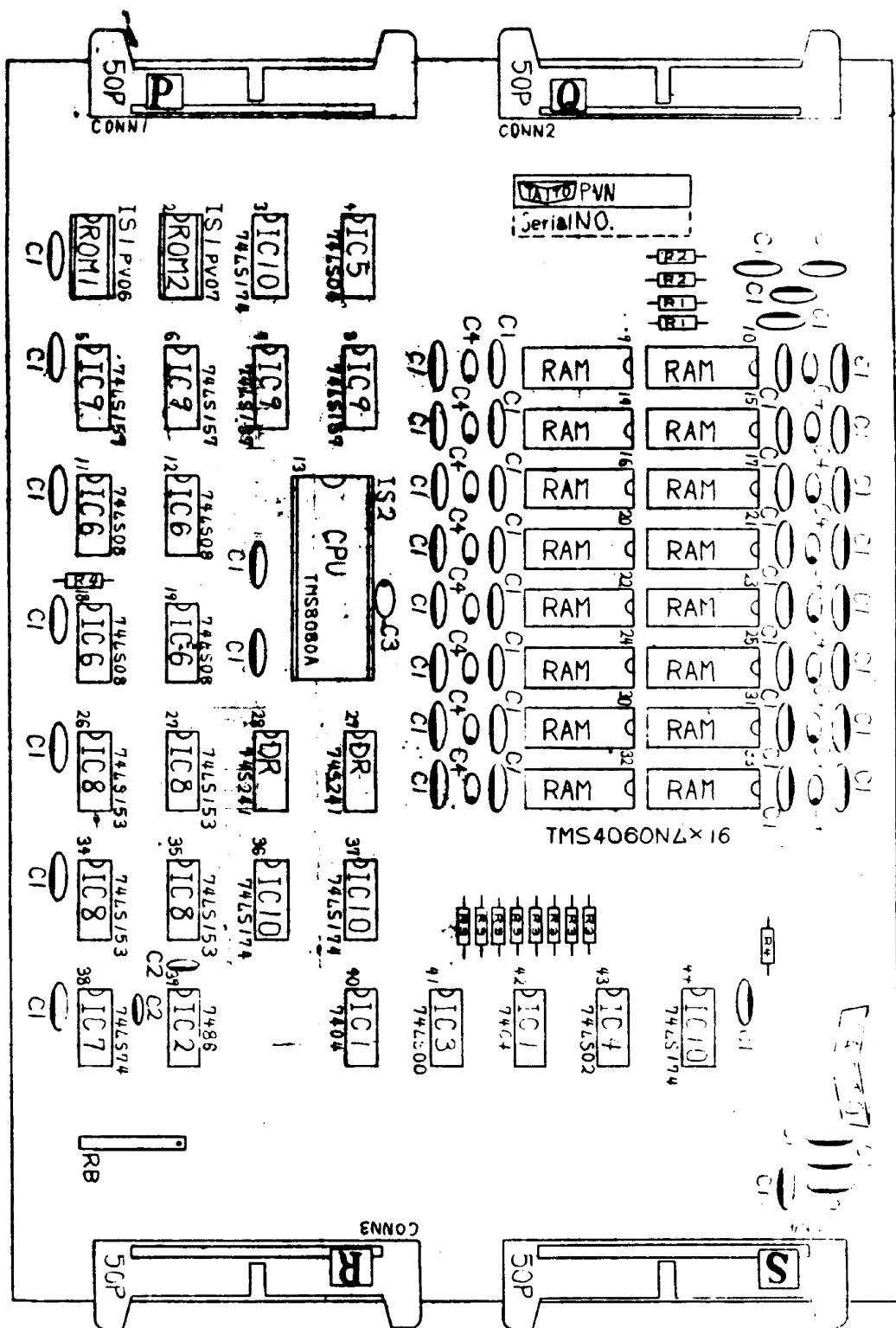
**C.P.U. - BOARD (B) C.V.**

**FIGURE 7**

ITEM	SYMBOL	TAITO PART NO.	DESCRIPTION	REFERENCE
1		802008	C.P.U.-P.C. BOARD	AAO 17757
2	P	122015	Connector Sticker, P	AAO 17653
3	O	122016	Connector Sticker, O	AAO 17656
4	R	122017	Connector Sticker, R	AAO 17659
5	S	122018	Connector Sticker, S	AAO 17662
6	50P	100000	Angle Pin Header, PS-50PA	AAO 55154
7	IS1	0960006	IC Socket, 18P	AAO 55103
8	IS2	090017	IC Socket, 40P	AAO 55812
9	IC1	075004	TTL IC 7404	AAT 32003
10	IC2	075055	TTL IC 7486	AAT 32013
11	RAM	078003	Dynamic Ram, TM4060NL, 4K	AAT 32091
12	IC3	076000	LS IC,74LS00	AAT 33001
13	IC4	076001	LS IC,74LS02	AAT 33003
14	IC5	076003	LS IC,74LS04	AAT 33005
15	IC6	076005	LS IC,74LS08	AAT 33009
16	IC7	076032	LS IC,74LS74	AAT 33051
17	IC8	076057	LS IC,74LS153	AAT 33108
18	IC9	076060	LS IC,74LS157	AAT 33112
19	IC10	076072	LS IC,74LS174	AAT 33127
20	CPU	077006	C.P.U.	AAT 34001
21	DR	075747	Bus Driver,74S241	AAT 35001
22	ROM1		PROM,PV06,4K	PVO 90007
23	ROM2		PROM,PV07-4K	PVO 90008
24	C1	040512	Cap,Film,TDY-1H-104	AAT 41244
25	C2	025325	Cap,Ceramic,DT201	AAT 41318
26	C3	035028	Cap,Tantalum,SSG16-22F	AAT 41424
27	C4	035512	Cap,Tantalum,SS625-1F	AAT 41425
28	R1	000031	Res,Carbon,330 ohm 1/4W±5%	AAT 51729
29	R2	000047	Res,Carbon,150 ohm 1/4W±5%	AAT 51745
30	R3	000055	Res,Carbon,330 ohm 1/4W±5%	AAT 51753
31	R4	000067	Res,Carbon,1K ohm 1/4W±5%	AAT 51765
32	RB	006059	Resistor Block,470 ohm 8 element	AAT 55041

## **C.P.U. - P.C. BOARD (B) C.V.**

**FIGURE 7**



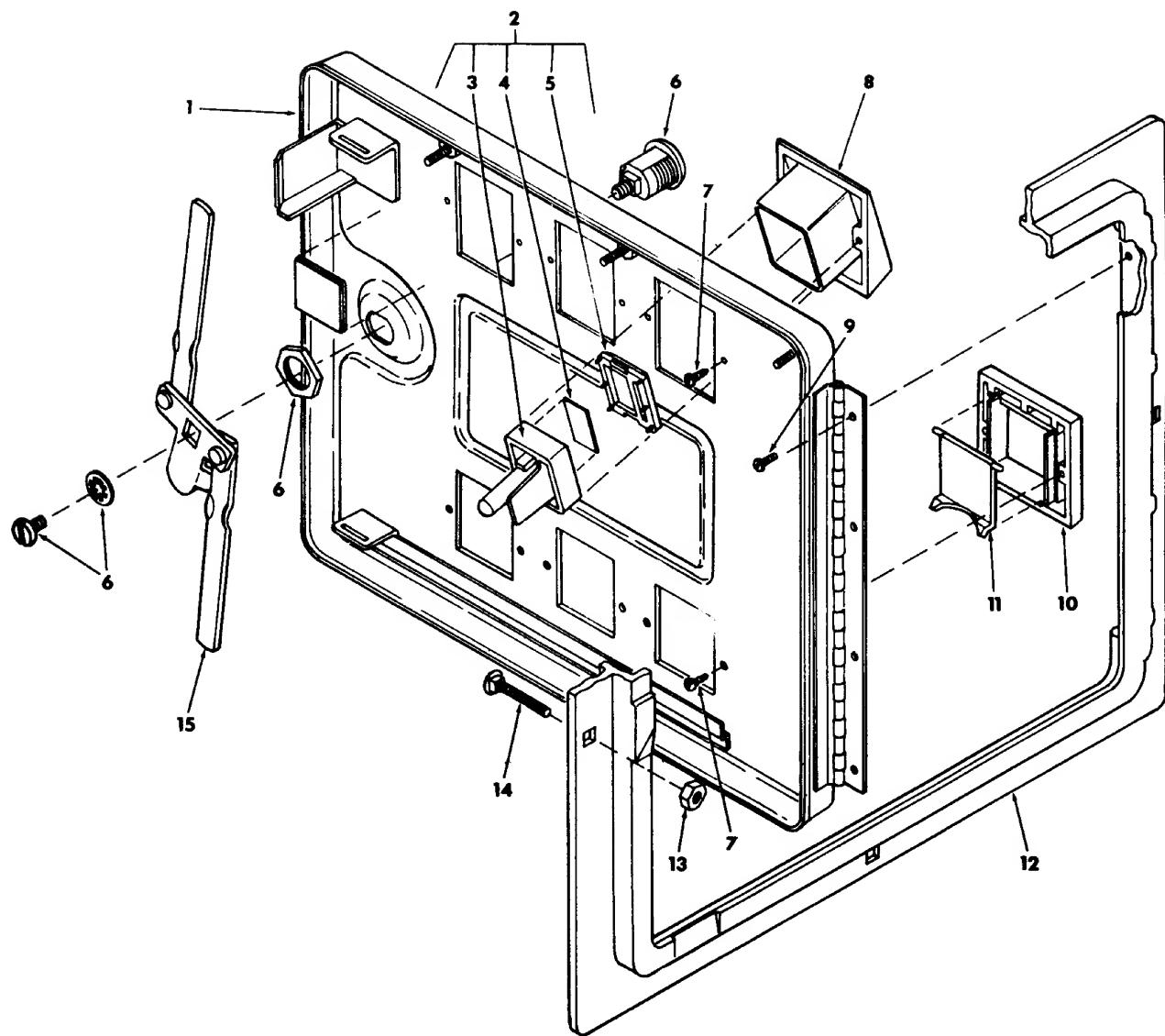
## COIN DOOR

FIGURE 8

ITEM	TAITO PART NO.	DESCRIPTION	REFERENCE
1	500114	Coin Door Only (2 coin)	404341
2	500115	Coin Return Button Assembly for U.S. 25¢ Coin	404348-1
3	400070	Coin Return Button	904591
4	120051	U.S. 25¢ Price Decal	904703
5	400071	Coin Return Button Cover for U.S. 25¢ Coin	904589-2
6	600013	Lock Assembly	904707-1
6A	600010	Lock Assembly	904707-1
7	600011	Screw	345-4-5
7A	600012	Screw	345-4-5
8	400059	Coin Button Housing	904588
9	300001	Screw #4-40 X 1/4 sl ph	325-4-4
10	400060	Coin Return Bezel	904590
11	400061	Coin Return Cover	904599
12	904581	Coin Door Frame 11 <sup>5/8</sup> " X 13 <sup>3/8</sup> " Mounts in a 10 <sup>3/8</sup> " X 12 <sup>3/16</sup> " Opening	904581
13	352011	Hex Nut 1/4-20	406-416
14	330020	Carriage Bolt	904734
15	600009	Lock Arm Assembly	404357

## COIN DOOR

FIGURE 8

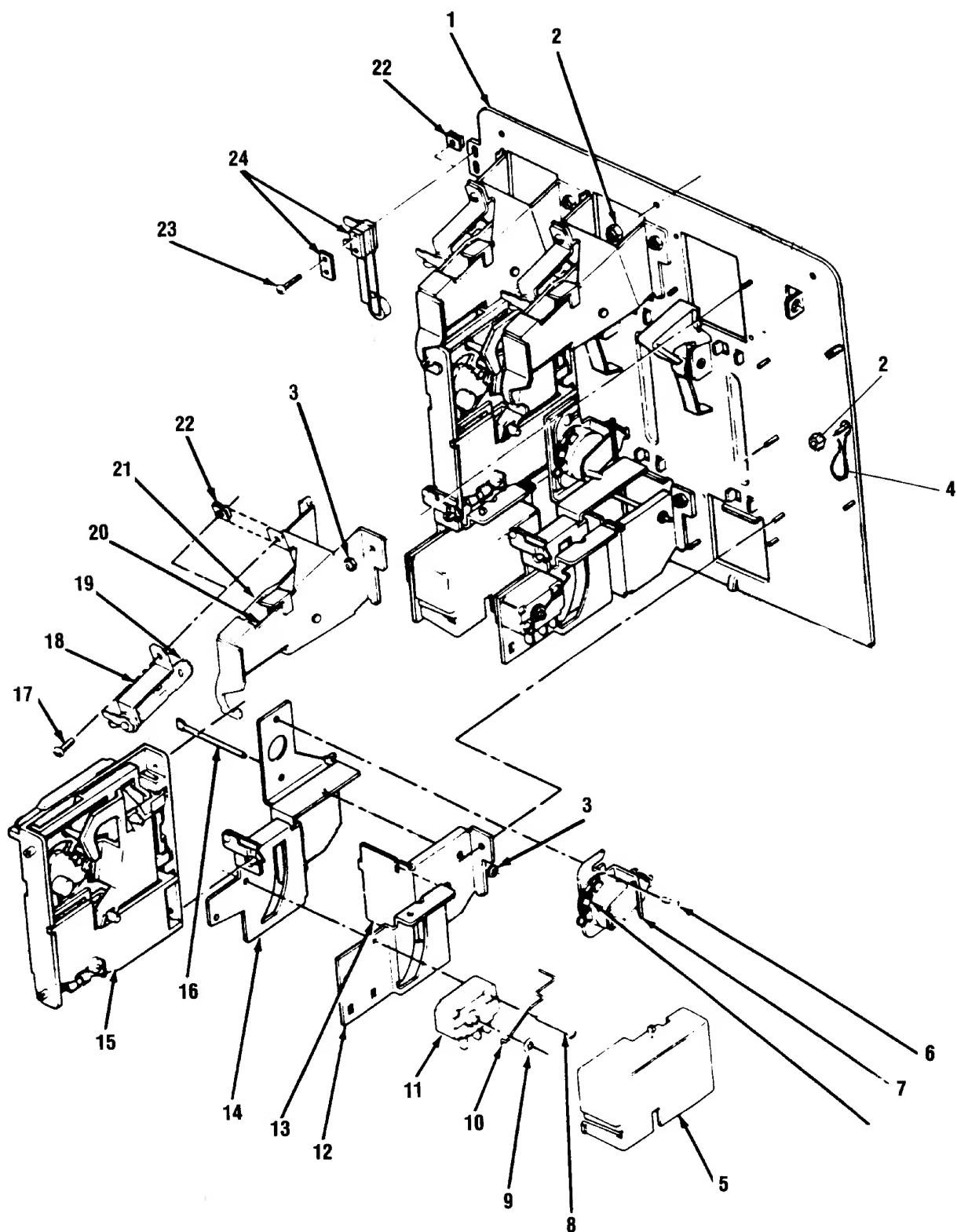


**COIN DOOR****FIGURE 9**

ITEM	TAITO PART NO.	DESCRIPTION	REFERENCE
1	500115	Inner Panel with Levers Sub Ass'y.	404429
2	354000	Nut #8-32	400-8
	840043	Custom Harness Assembly	
	840044	Custom Harness Assembly	
3	354001	Nut #4-40	400-4
4	500117	Wire Key Holder	904722
5	400062	Switch Cover	904762
6	300040	Screw #6-32 X 3/16 SL PH	100-6-3
7	015002	C.R.E.M. Coil Assembly	404354
8	300040	Screw #6-32 X 3/16/SL PH	100-4-12
9	390036	Retainer	900651
10	370003	Silver Switch Wire for US 25¢	904710-1
11	020502	Switch	904845
12	500118	Coin Chute	904701
13	500119	Coin Return Box	904598
14	500116	Switch & C.R.E.M. Coil Bracket Assy.	404428
15	400077	25¢ Acceptor	5301-10
16	500120	Bar	905115
17	300038	Screw 4-40 X 3/8 sl ph	110-4-6
18	113002	Miniature Bayonet Base Lamp Socket	904717
19	112001	#47 Lamp (6.3 Volt)	904716
20	500121	Coin Inlet Chute Sub Assembly	404418
21	500122	Right Half of Coin Inlet Chute	904594
22	355001	"U" Type Fastener	904712
23	300039	Screw 4-40 X 1/2 sl ph	116-4-8
24	024002	Slam Switch Assembly	904704

## COIN DOOR

FIGURE 9



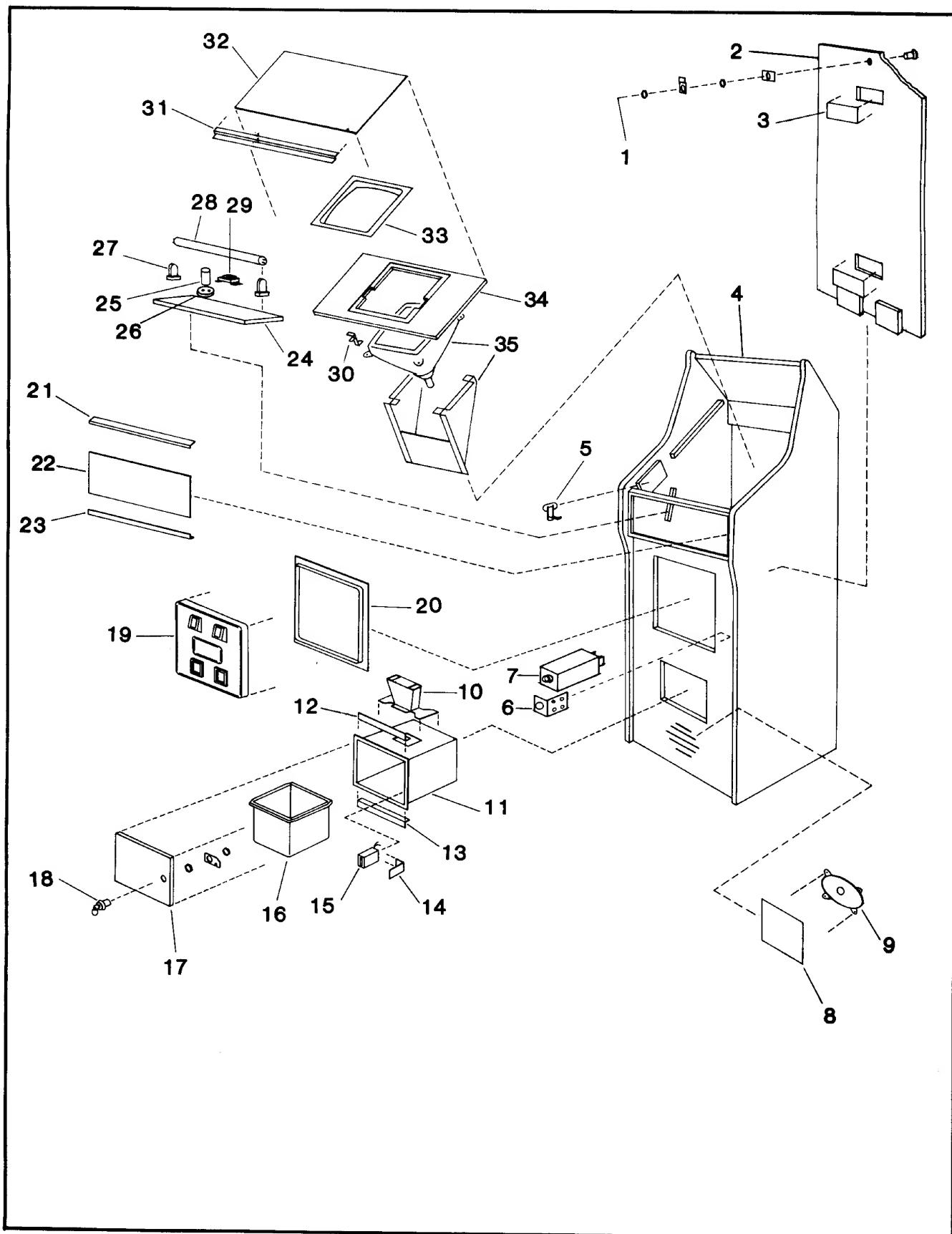
## VIDEO AND CABINET ASSEMBLY

FIGURE 10

ITEM	TAITO PART NO.	DESCRIPTION	REFERENCE
1	600005	Lock Assembly	
2	500074	Back Door	
3	500074	Grill Door	
4	860004	Cabinet Assembly	
5	390002	Clamp	
6	500123	Service Switch Bracket	
7	024502	Service Switch	
8	500072	Speaker Grill	
9	014003	Speaker	
10	500112	Coin Funnel	
11	500101	Cash Case	
12	500086	Cash Box Bracket (Top)	
13	500087	Cash Box Bracket (Bottom)	
14	500091	Counter Bracket	
15	115000	Counter	
16	400050	Cash Box	
17	500089	Cash Box Door	
18	600006	Lock and Key	
19	500114	Coin Door	
20	500113	Coin Door Frame	
21	500100	Marquee Retaining Bracket (Upper)	
22	400083	Marquee	
23	500009	Marquee Retaining Bracket (Lower)	
24	140048	Fluorescent Panel	
25	114000	Starter	
26	114001	Starter Socket	
27	113000	Lamp Socket	
28	112000	Fluorescent Bulb	
29	010002	Transformer, Ballast (220v, 50 Hz)	
29A	010001	Transformer, Ballast (120V, 60 Hz)	
30	500026	Monitor Mounting Bracket	
31	500107	Cover Glass Retaining Bracket	
32	148014	Cover Glass	
33	400082	Monitor Shroud	
34	140063	Monitor Mounting Panel	
35	620012	Monitor	

## VIDEO AND CABINET ASSEMBLY

FIGURE 10



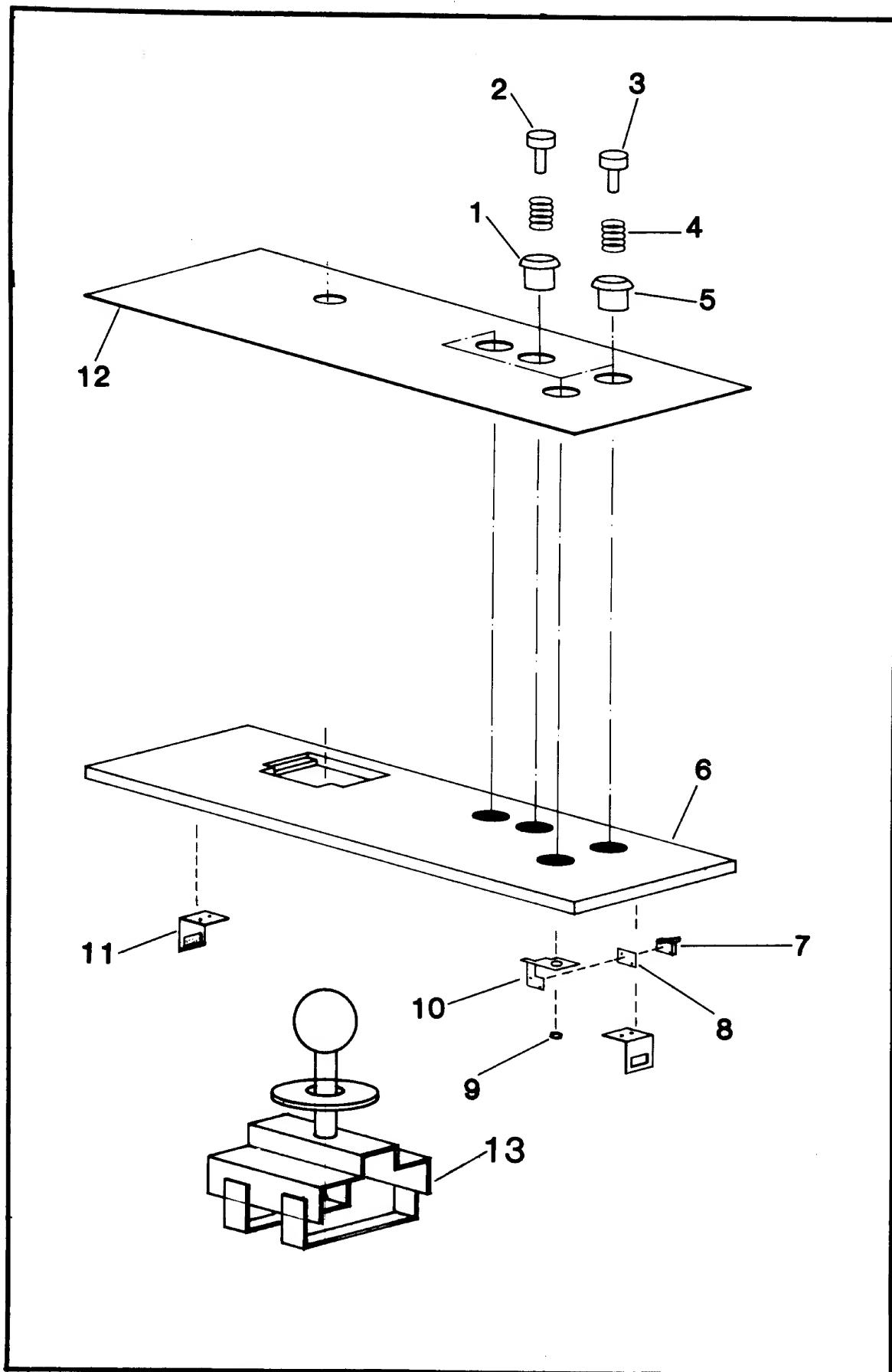
## CONTROL PANEL

FIGURE 11

ITEM	TAITO PART NO.	DESCRIPTION	REFERENCE
1	400013	Push Button Housing (Red)	AAO 19534
2	400012	Push Button (Red)	AAO 19533
3	400014	Push Button (White)	TRO 90012
4	370000	Spring	BPO 50001
5	400015	Push Button Housing (White)	TRO 90013
6	140069	Control Panel - Wood	
7	020501	Micro Switch VL-11L	AAO 52531
8	199010	Insulator	AAO 19504
9	355000	Nut	
10	500018	Switch Mounting Plate	WPO 30002
11	390003	Strike Hook	
12	500143	Control Panel Screened Aluminum	
13	850084	Two-Way Control	

## CONTROL PANEL

FIGURE 11



# WIRING DIAGRAM

FIGURE 12

